Sustainable Transport – What is the Status? - an up-date from the ‘SUSTAIN’ project

Gudmundsson, Henrik

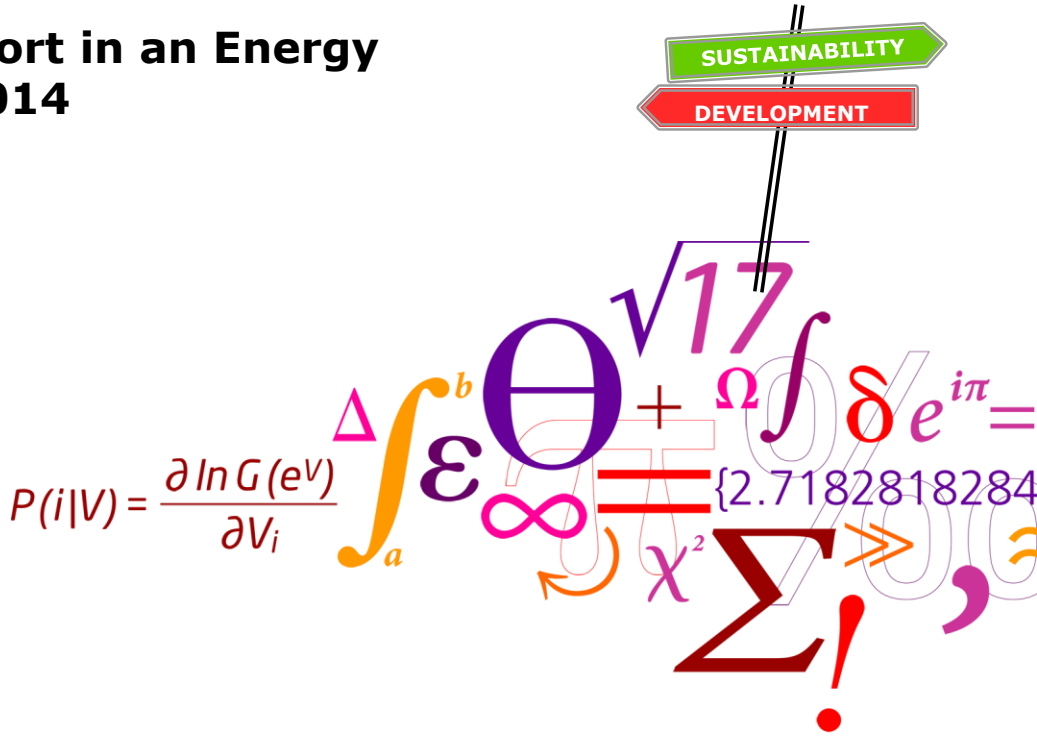
Publication date:
2014

Document Version
Peer reviewed version

Sustainable Transport – What is the Status?
- an up-date from the 'SUSTAIN' project

Henrik Gudmundsson, DTU Transport

Future Truck and Public Transport in an Energy Perspective, DTU, 9. October 2014



DTU Transport
Department of Transport

Status for 'Sustainable Transport' in Denmark

- Broadly **accepted** as a policy goal in Denmark, but
  - No offcial ST **definition**
  - No official ST **plan**
  - No official ST **measurements**
- **Instead**: Preliminary observations from the **SUSTAIN** research project and other national and international sources, considering key goals and trends

SUSTAIN project

- Transport research Project funded by the Strategic Research Council of Denmark

- 2012-2016

Main partners

DTU Transport
Institut for Transport

Copenhagen Business School
HANDELSHØJSKOLEN

International contributors

UNIVERSITY OF OXFORD

MONASH University

TEXAS A&M UNIVERSITY

User Forum

Road Directorate

Transport Agency

CONCITO think tank

COWI

Øresund Logistics

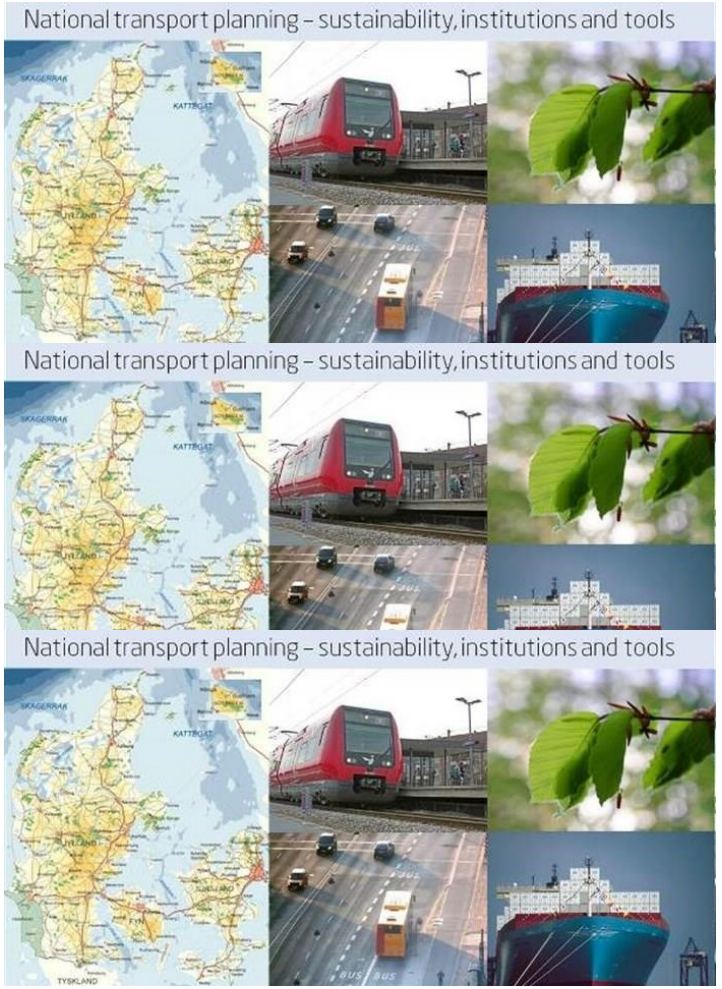
Trafikanalys, Sweden

Purpose of SUSTAIN

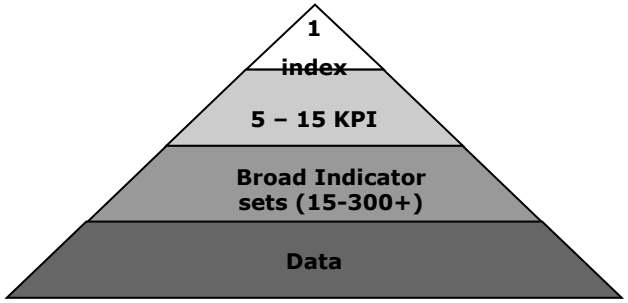
- To **study** National Sustainable Transport Planning (NSTP) as it occurs in practice

- To **support** NSTP in Denmark by contributing:
  - Concepts,
  - Indicators,
  - Assessment tools, and
  - A practice framework

- To **establish** NSTP as an coherent international research topic across social and technical sciences



Measuring Sustainable Transport

What?	How?	Why?
Sustainable Dev. principles	Multiple indicators	Information and enlightenment
Sustainable Transport goals and strategies	Monetary values	Analysis and diagnosis
Transport impacts	Aggregate index	Performance evaluation
		Decision making
		Benchmarking/ Learning

Sustainable Development: basic definition

Chairman of World Commission of Environment and Development (WCED) Gro Harlam Brundtland

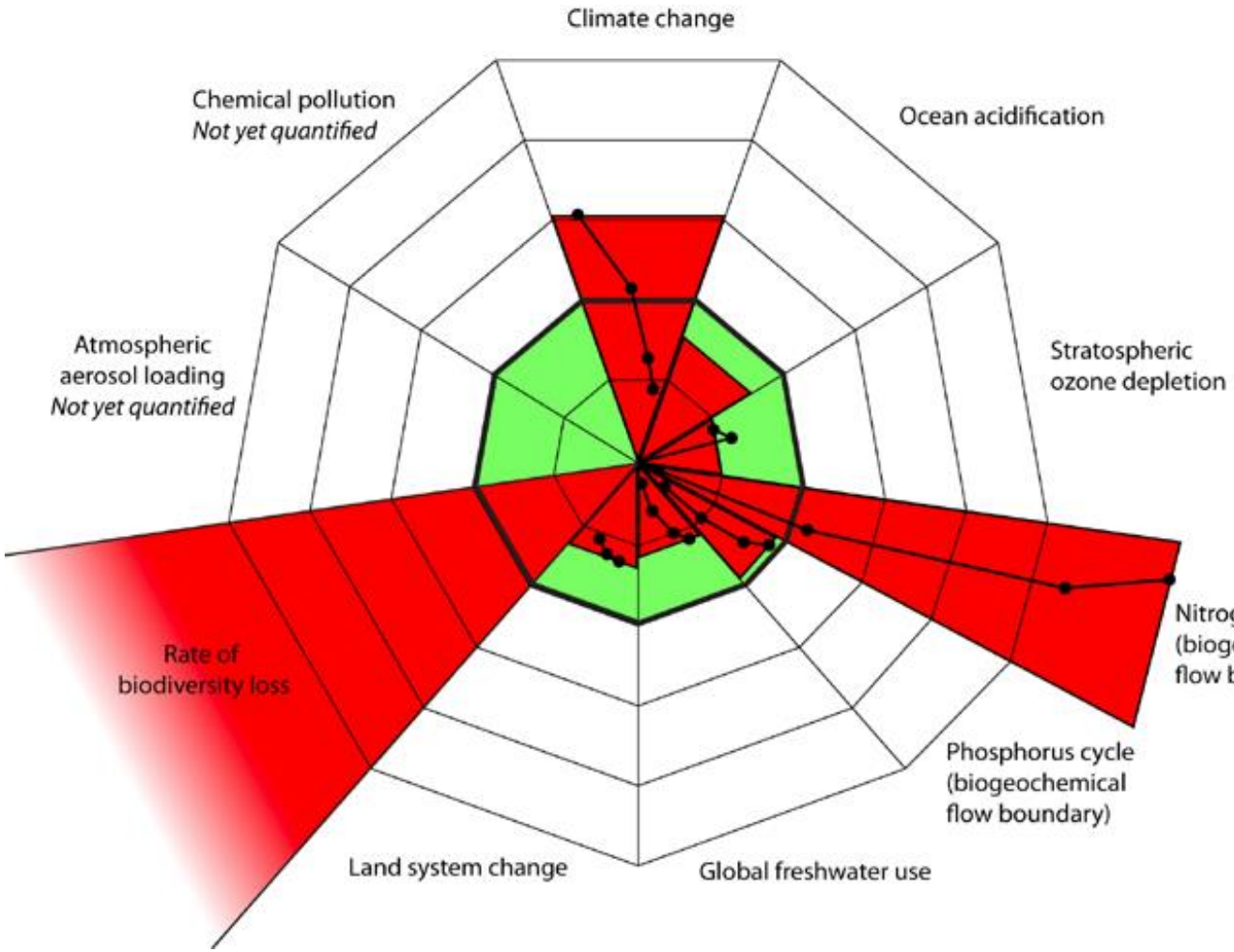
"Sustainable Development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs"

It contains within it **two key concepts**:

· the concept of '**needs**', in particular the essential needs of the world's poor, to which overriding priority should be given; and

· the idea of **limitations** imposed by the state of technology and social organization on the **environment's** ability to meet present and future needs.

Planetary boundaries



Most critical:

- ***Biodiversity*** *(halt the loss of species)*
- ***Climate Change*** *(not exceed +2 degrees)*
- ***Nitrogen cycle***

Source: Rockström et al 2009

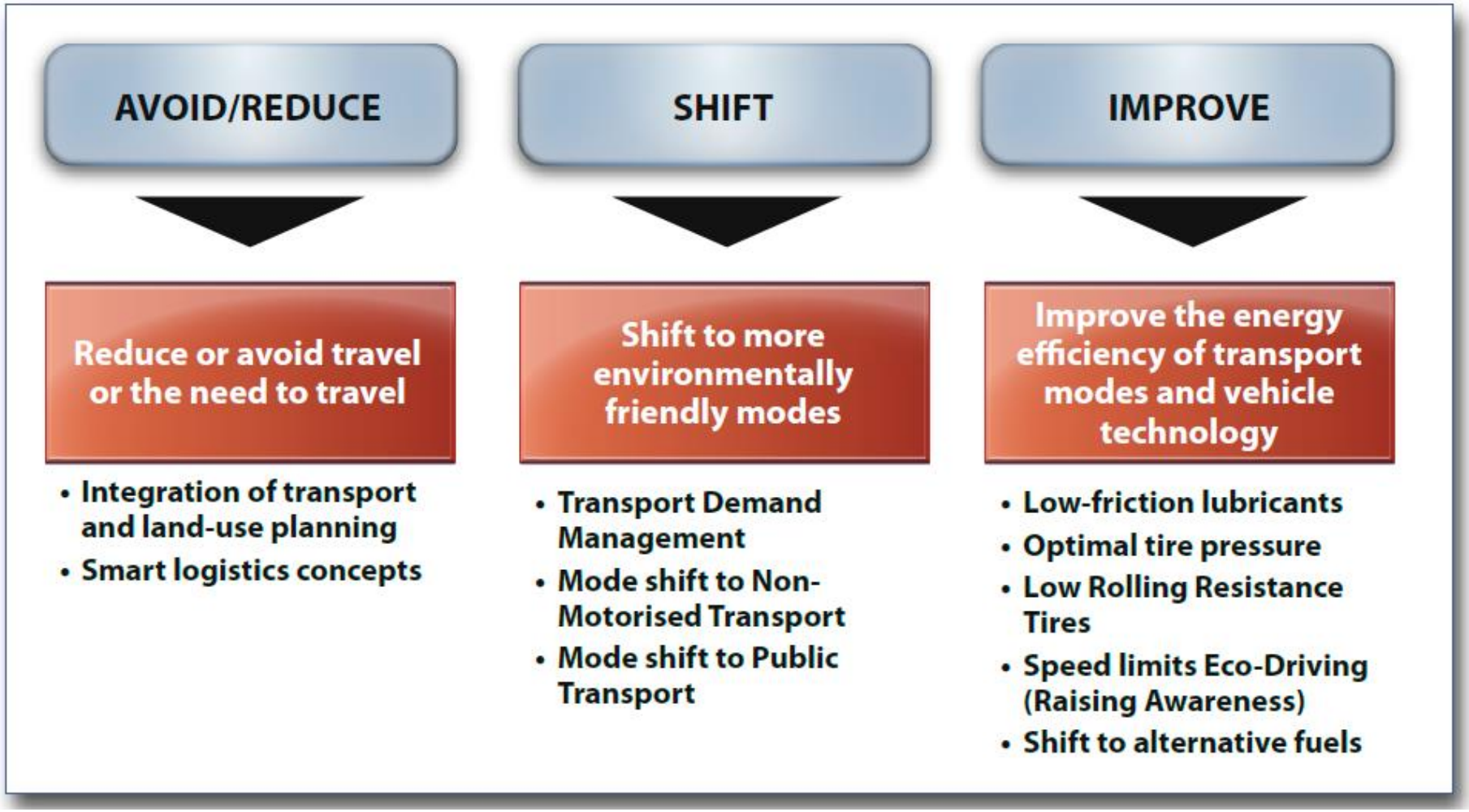
Sustainable Development: Key Dimensions

	Environmental Dimension	Social Dimension	Economic Dimension
Present generations needs	• Environmental quality • Distribution of environmental impacts	• Quality of Life, Human Develop-ment; health • Distribution of social amenities	• Income and economic performance • Distribution of income and jobs
Future generations needs	• Ecosystems, Climate stability, Resources; • Preserving Natural Capital	• integrity and stability of the social systems • Maintaining Social Capital	• Savings and investments for the future • Preserving Man-made Capital
	Institutional/strategic dimension • Integrated decision making • Involvement of stakeholders and major groups • Change and adaptation		

Key impacts of transport

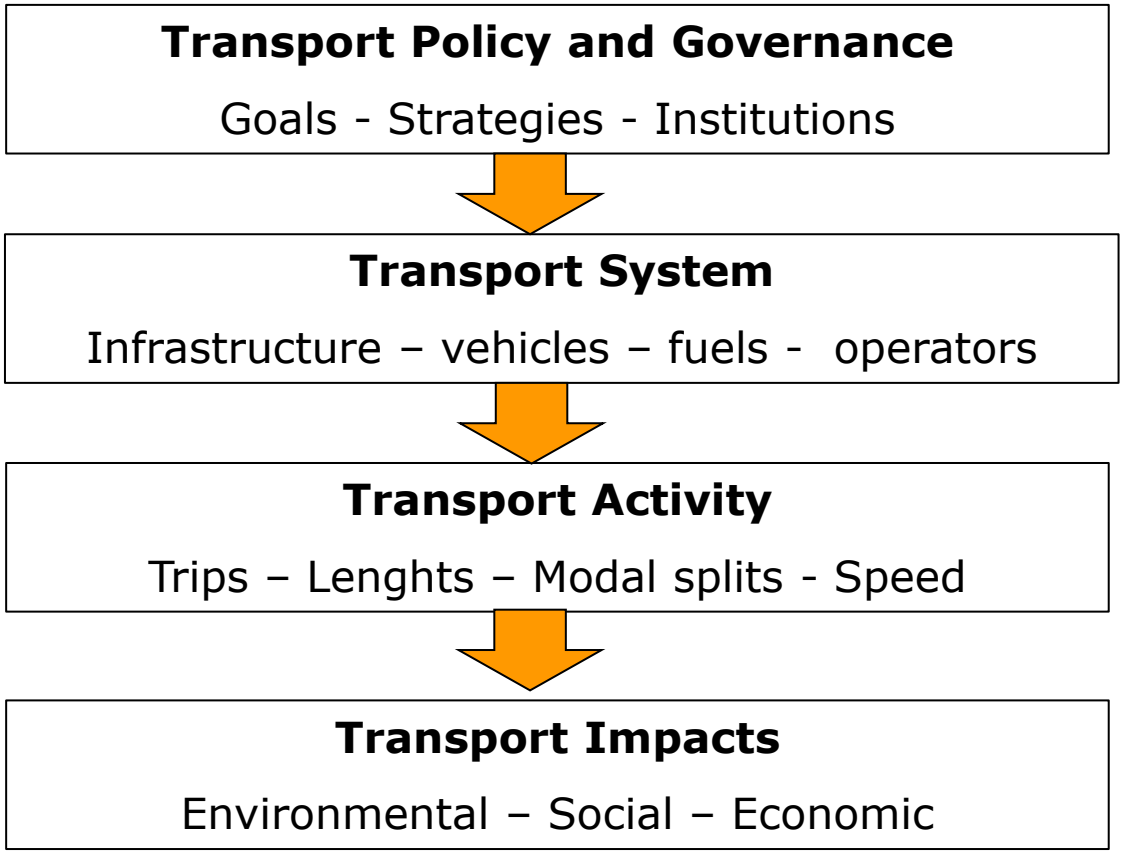
Environmental	Social	Economic
• Air pollution • Noise pollution • Vibrations •Visual intrusion • Water pollution • Solid waste •Release of toxic substances • Consumption of land	• Mobility • Accessibility • Accidents • Barriers for the disadvantaged •Obesity • Community livability • Gender imbalances	• Travel time • Costs of transport to customers/consumers •Transportation facility construction costs • Maintenance and disposal costs • Costs relating to accidents •Transportation-related health costs
•Disruption of ecosystems and habitats • Hydrologic impacts/flooding • Introduction of exotic species • Depletion of the ozone layer • Global climate change	•Cohesion/integration • Opportunity • Migration • Anxiety/'Rootlessness'	•Stimulation of economic growth • Agglomeration effects •Job/labour market effects • Opportunity costs

Sustainable Transport Strategies

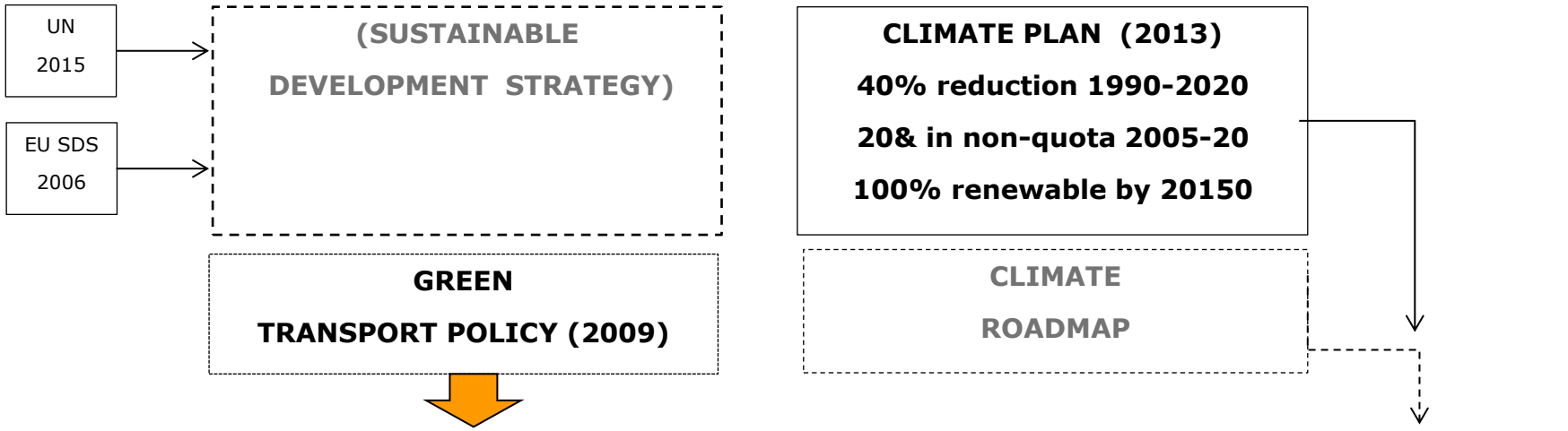


Source: energypedia.info/wiki

Indicator areas



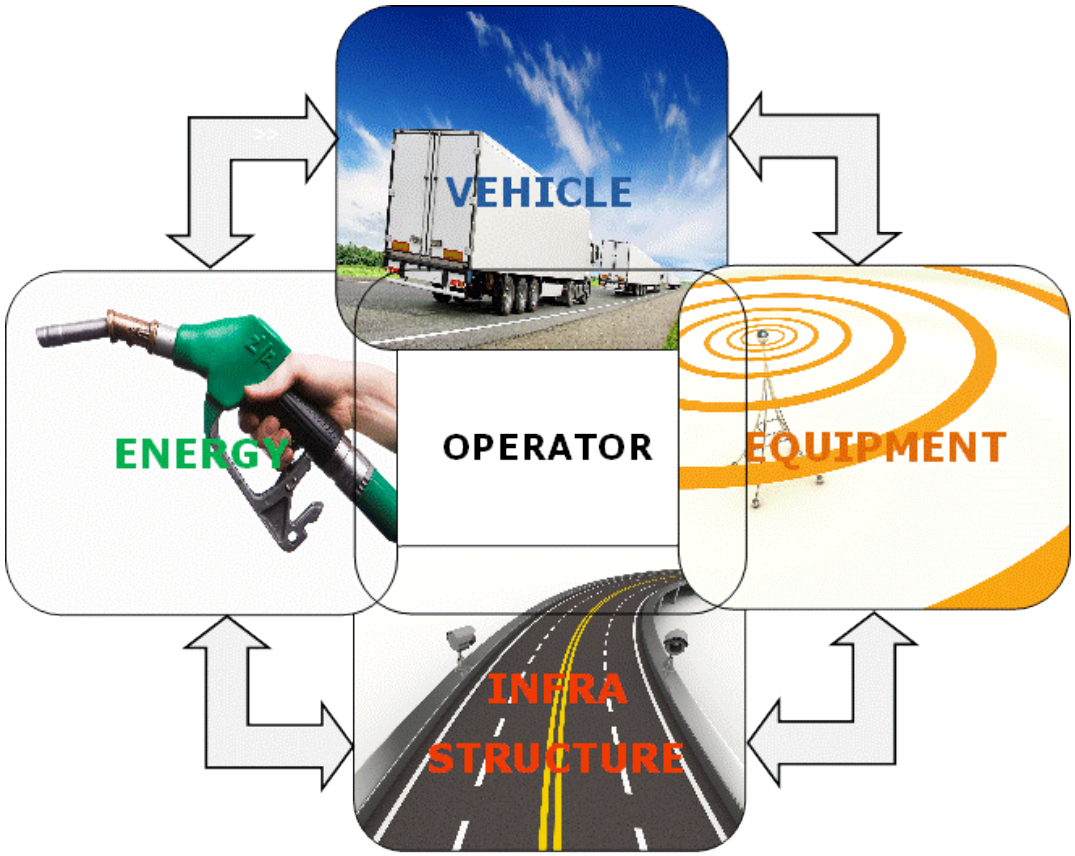
1. Transport policy and governance



Public transport	**To absorb most of future transport growth**
Roads	**To be expanded where the greatest needs are**
Cycling	**To be preferred where possible**
Infrastructure	**Must not destroy irreplacable nature**
Technology	**DK as green laboratory**
CO_2	**To be reduced, using green taxation**
Noise and Air pollution	**Reduce in cities**

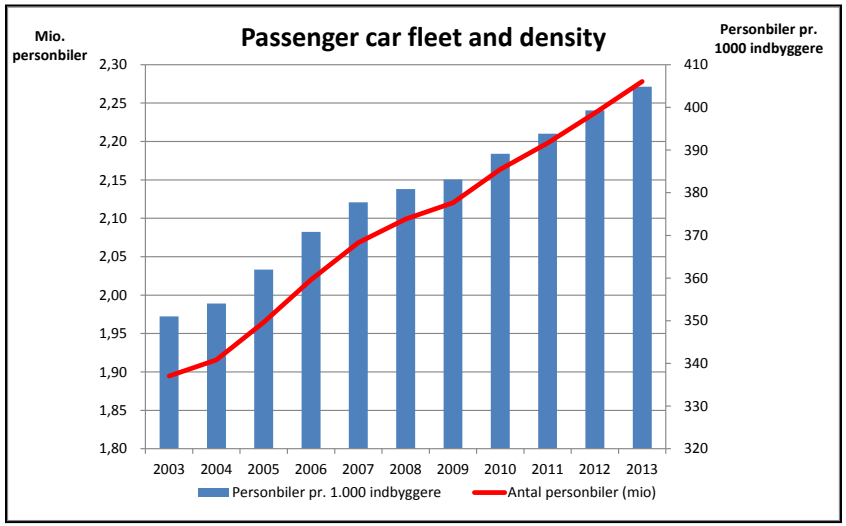
- **Agency contracts**
- **Strategic studies**
- **Policy measures**
- **Projects**

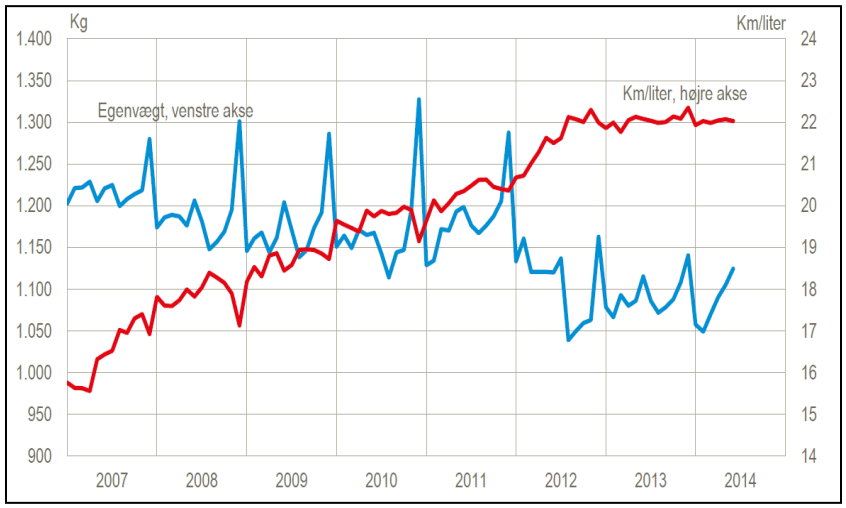
2. Transport system



- **Quantity**
- **Quality/efficiency**

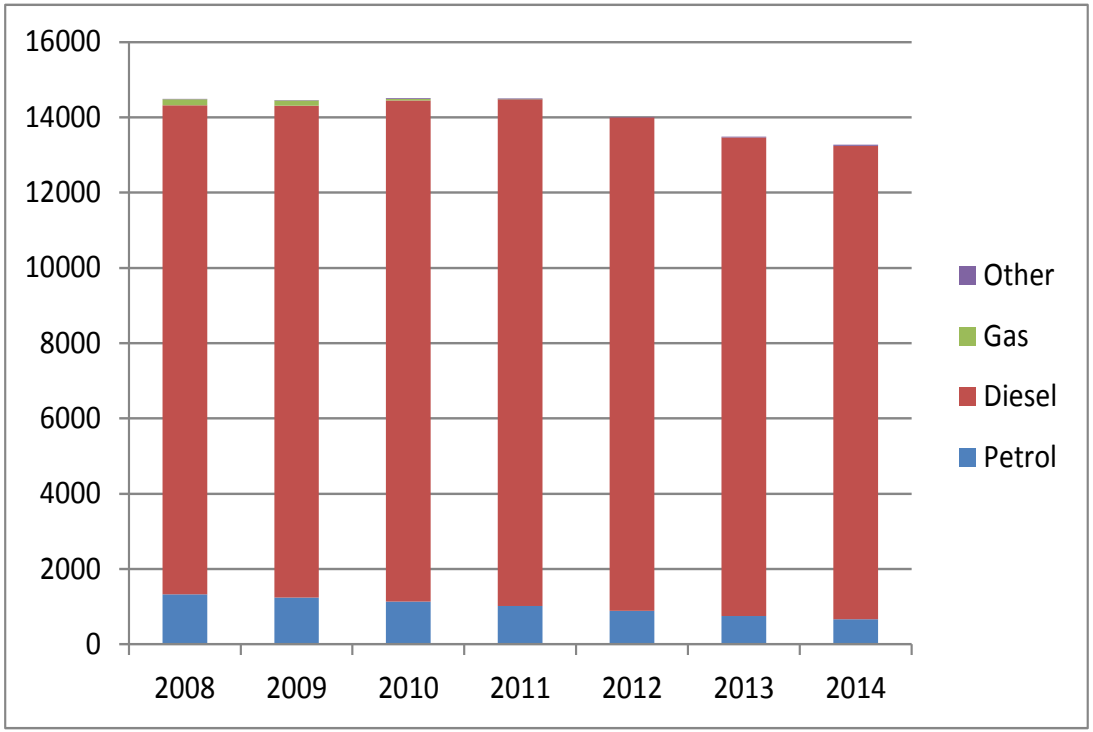
Passenger cars





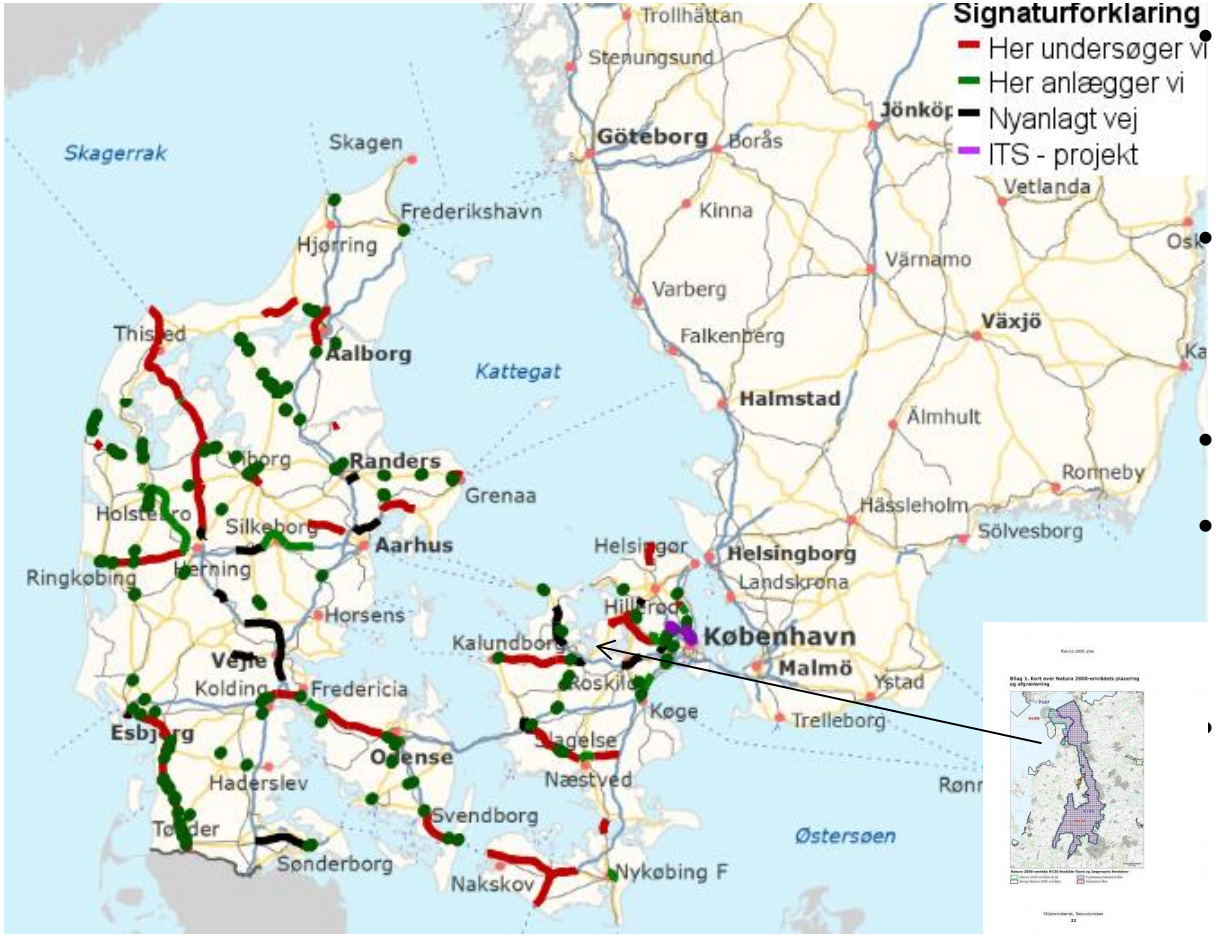
- Car fleet 9% increase from 2009
- 180.000 new registrations in 2013
- Of these 647 were EVs (less than 0,5%)
- Fuel efficiency of new registrations has improved 35% since 2007, but stagnation for 2 years now
- Possibly over-estimation due to inadequate test cycle

Bus fleet in Denmark by fuel



- Bus fleet slightly shrinking
- Still complete diesel dominance
- Gas buses dropped from 163 in 2008 to ”0” in 2013 (but new fleets are emerging)

Infrastructure



- National road network growing ca 225 km/year
- National motorway network 18% growth since 2006
- Many new projects…
- Some in potential conflict with nature proctection areas…
- Almost no rail added since 2006

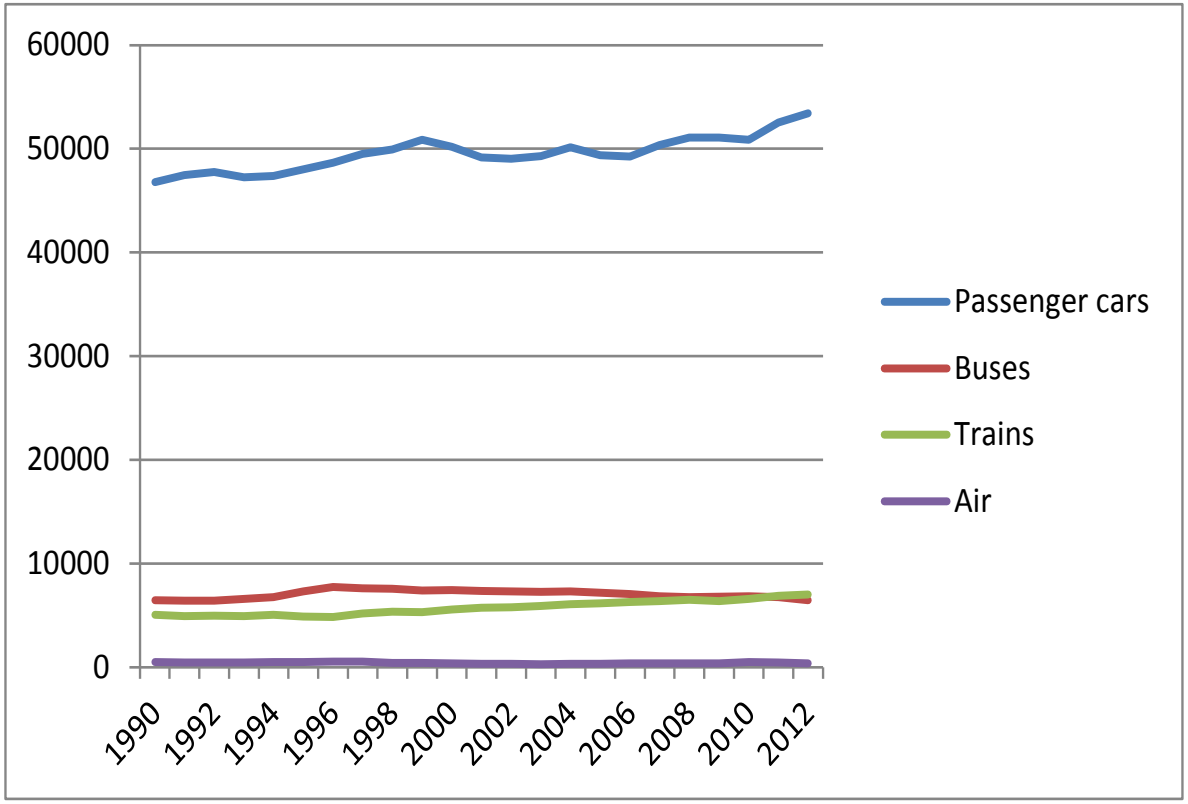
"EU-dom sår ny tvivl om højbro over Roskilde Fjord"

Biofuel

- EU countries differ in regard to fulfliling biofuel 10% target by 2020
- Denmark has advanced rapidly the last year (now at ca 6%)
- Only including biofuel fulfilling sustainability criteria

Source : European Environment Agency 2014 (draft)

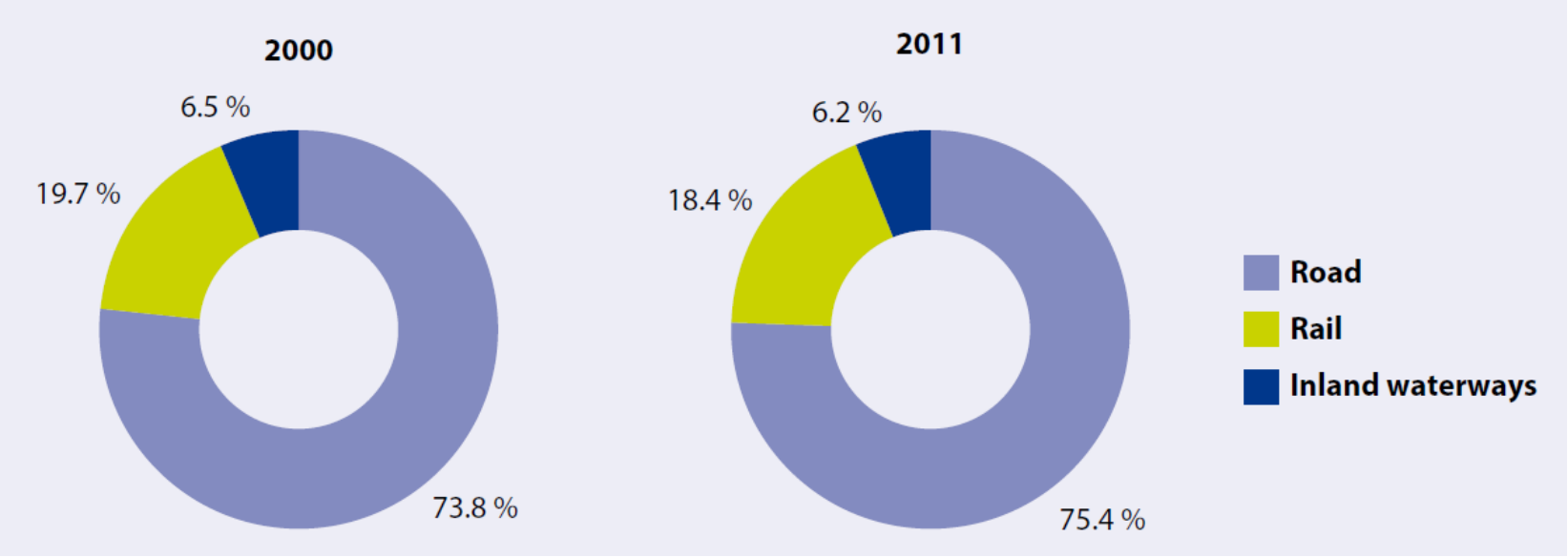
3. Transport activity



- Passenger travel growing slowly
- Main increase is on passenger car side (+ 6% over last 5 years) not public transport
- 10% growth in trains, but out of small share
- Decline in buses

Source : Statistics Denmark

Freight transport EU-27



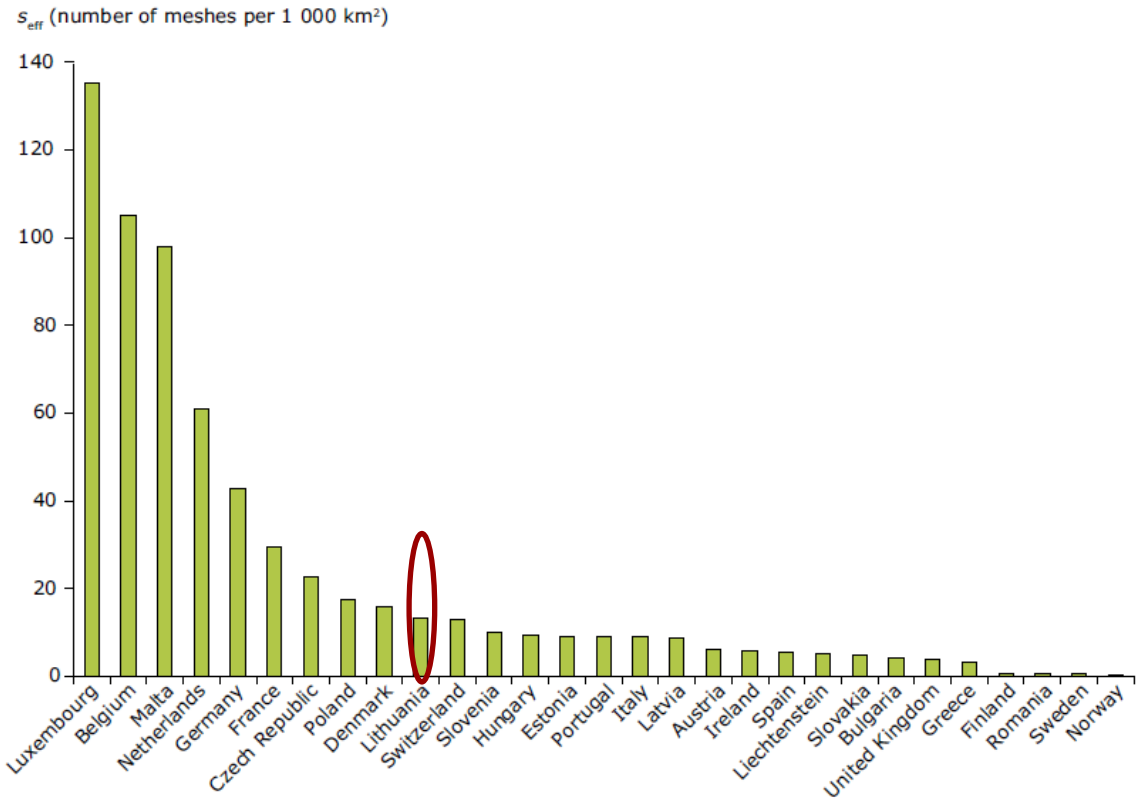
- No evidence of modal split

Source : EUROSTAT 2013

4. Transport impacts

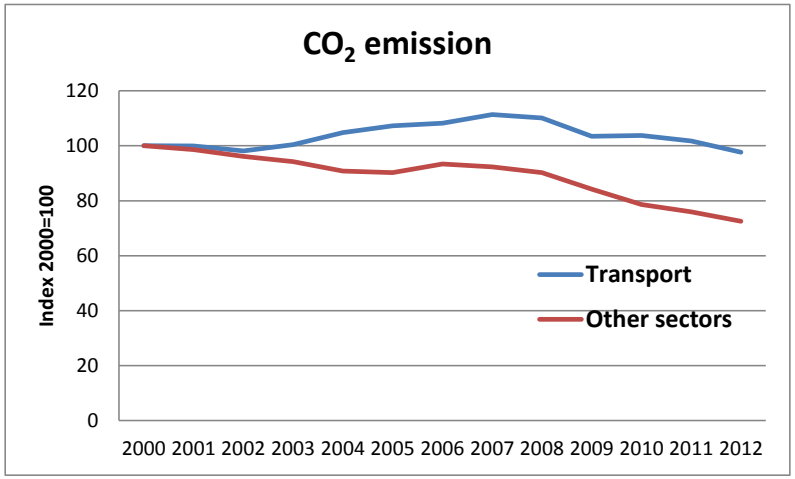
Landscape fragmentation

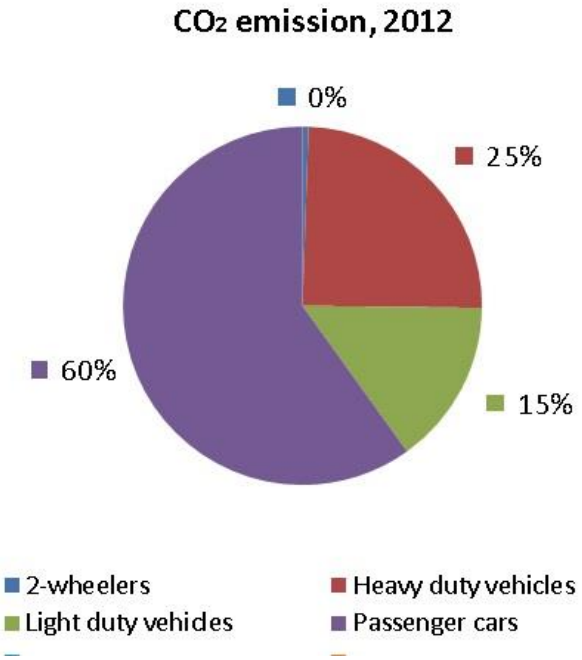
Figure 3.1 Bar diagram of effective mesh density values per country for FG-B2 in 2009



Source : European Environment Agency 2011)

Emissions





- Transport GHG emissions in decline, but lesss/slower than other sectors
- Transport sector shares of emissions:
  - CO_2 : 30%
  - NO_x : 46%
  - NMVOC: 21%
  - PM2,5: 11%
- CO_2 Pass/'Freight'

  60 / 40

Source : Danish Energy Agency, Energy Statistics and : DCE, Aarhus University 2013

Sustainable Transport at EU level

Level 1	Level 2	Level 3
Energy consumption of transport relative to GDP	**Transport and mobility**	
	Modal split of freight transport	
	Modal split of passenger transport	
	Transport impacts	
	Greenhouse gas emissions from transport	
	People killed in road accidents (*)	

(*) From 2001

Source : EUROSTAT 2013

Conclusions (1)

- Sustainability is a **complex** notion, involves much more than CO_2

- Only very few examples given here

- **Limited evidence** of progress on sustainability in Denmark:
  - Limited **data and tracking**
  - Limited **actual policy** efforts
  - **Long lead time** for policies to be adopted, implemented and take effect (slow turnover)
  - No agreement on how to **interpret** 'sustainability'
  - Many initiatives '**below the radar**'

Conclusions (2)

1. **Governance and policy:**
   - Sustainability widely accepted but no comprehensive strategy/plan
   - Limited interconnection between existing strategies
   - Limited implementation of ST goals in contracts, studies, policies

2. **Transport system**
   - Not much evidence of change towards sustainability
   - 'Conventional' fuels, vehicles, infrastructure tend to dominate
   - Progress in fuel efficiency, but uncertain

3. **Transport activity**
   - No evidence of modal shift towards public/rail

4. **Transport impacts**
   - Emission are starting to decline, but fast enough?
   - Alarmingly little information on other impact trends

Non-use of indicators…

"Political decision makers…gather information and do not use it; ask for more information and ignore it; make decisions first and look for relevant information afterwards; and collect and process a great deal of information that has little or no direct relevance to decisions" .

(Sager & Ravlum, 2005)

International conference

Abstracts:
http://precis2.preciscentral.com/Link.aspx?ID=D60E124A61FCF1C6

TRB CALL FOR PRESENTATIONS

Transportation for Sustainability

An International Conference

May 7–8, 2015

Keck Center of the National Academies
Washington, D.C.

The conference will examine and promote approaches that adopt a holistic view on sustainability, combining the key dimensions of sustainability—economic, social, and environmental—and addressing present and future needs. It will aim to stimulate debate on how this view can be consolidated into practice and research and will explore ways to institutionalize sustainable practices globally.

Join leading international experts, industry innovators, researchers, and policy makers for three days of presentations, panel discussions, and joint activities featuring thought-provoking examples of sustainability thinking, analysis, and practice in the transportation field.

Save the Date

May 6: **Preconference Activities**
May 7–8: **Conference**

Call for Presentations and Posters

Due October 15, 2014

The Planning Committee is seeking exceptional presentations and student posters on transportation for sustainability. Please submit abstracts via the website link: http://precis2.preciscentral.com/Link.aspx?ID=D60E124A61FCF1C6.

Topics

1. **Global Initiatives on Sustainability in Transportation**

International frameworks for incorporating sustainability into transportation; impacts of sustainable—or unsustainable—transportation on the global economy; sustainability issues in air travel, marine travel, and at border crossings.

2. **Policies, Programs, Projects, and Institutional Approaches**

Case studies; national, state, or local sustainability strategies or policies; institutional arrangements for adopting sustainability approaches.

3. **Assessment, Monitoring, and Evaluation**

Metrics needs and existing tools to measure sustainability in transportation; data resources; applications of sustainability measurement.

For more information, contact:

Monica A. Starnes, mstarnes@nas.edu
Brittney Gick, bgick@nas.edu

More information

SUSTAIN Homepage

http://www.sustain.transport.dtu.dk/english

Recent Publications

- Hall, R. P., Gudmundsson, H., Marsden, G. & Zietsman, J. 2014. Sustainable Transportation. *Encyclopedia of Transportation: Social Science and Policy.* Sage Publications
- Barfod, M.B. and Pryn, M.R. (2014). Involving stakeholders in transport decision making using planning workshops and MCDA. IFORS2014 conference, July 2014.
- Gudmundsson, H. Leleur, S. Sørensen, C.H. Strategisk transportplanlægning Gør vi bæredygtige fremskridt, 'Trafik og Veje' August 2014
- Pryn; M, Coret, Y, Salling K.B, The SUSTAIN-DSS model for Sustainable Transport Assessment, Trafikdage, Aalborg 2014
- Hodge, Graeme and Greve, Carsten (2013) Public-private Partnership in Developing and Governing Mega-projects. International Handbook on Mega-projects. ed. / Hugo Priemus; Bert van Wee

Contact

Henrik Gudmundsson, projekt coordinator

hgu@transport.dtu.dk

EXTRA

National Sustainable Transport plannnig

"Systematic, knowledge based efforts
to integrate Sustainable Development principles,
criteria and goals in the design, implementation,
management and regulation of
nationally significant transport systems and
services "

(*SUSTAIN definition*)